

COLLECTING WITH A CAMERA.

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Photographs of living insects in their natural surroundings contribute both added interest and added value to a collection of mounted specimens. Such pictures record in vivid form facts about the living attitudes and habits of the insects. In effect, a good photograph of the kind arrests the creature in the midst of a story-telling action and permits us to examine it closely at leisure. The minimum requirements of a good insect picture are: It must record the subject large enough to show it in detail; and the subject must be in perfect focus.

Equipment. If we try to photograph even the larger insects with an ordinary folding camera or a box camera, we have to stand too far away; the subject is recorded on the film in pin-head proportions. In collecting several thousand insect pictures during the past ten years, I have tried reflex cameras, twin-lens outfits, miniature cameras and view cameras. The outfit that has best stood the test of time is a Zeiss Ideal, a $3\frac{1}{4} \times 4\frac{1}{4}$ -inch film-pack camera equipped with a Tessar lens, a ground glass back for focusing and a double-extension bellows. The latter feature enables you to get close to your subject. By adding two auxiliary lenses, each costing in the neighborhood of five dollars, you can possess a versatile outfit able to record four different types of insect pictures, ranging up to magnifications a dozen times natural size.

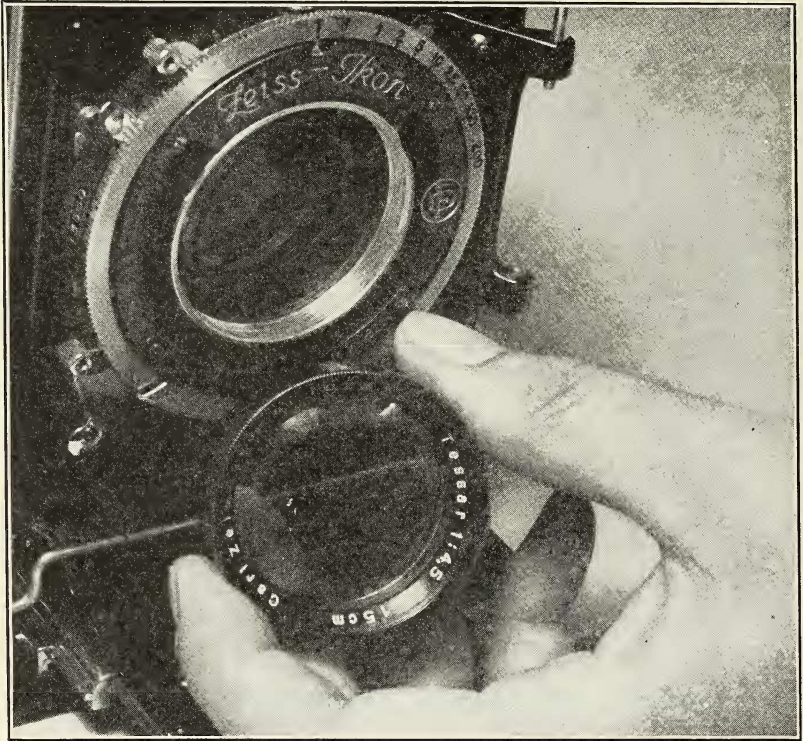
I. With the double-extension bellows pulled out, you can work close enough to your subject to record in sharp detail the larger insects such as butterflies, moths, katydids and praying mantes.

II. With a *proxar* lens slipped over the *Tessar* lens, you can bring your camera even closer and record crickets, grasshoppers, beetles and similar insects at approximately life size.

III. With the *proxar* removed and the front element of the *Tessar* screwed out, using only the rear element of the lens, you can snap pictures of smaller insects at nearly twice natural size.

IV. And, finally, with the *Tessar* and its shutter removed entirely and replaced with a one-inch-focal-length lens, you can record magnified pictures of insect heads and other parts, enlarged as through a microscope.

Such a lens, from a 16-millimeter home movie camera, can be purchased in a second-hand photographic store and easily mounted in a wooden holder to fit in the opening at the front of the camera which ordinarily holds the *Tessar* and its accompanying *Compur*

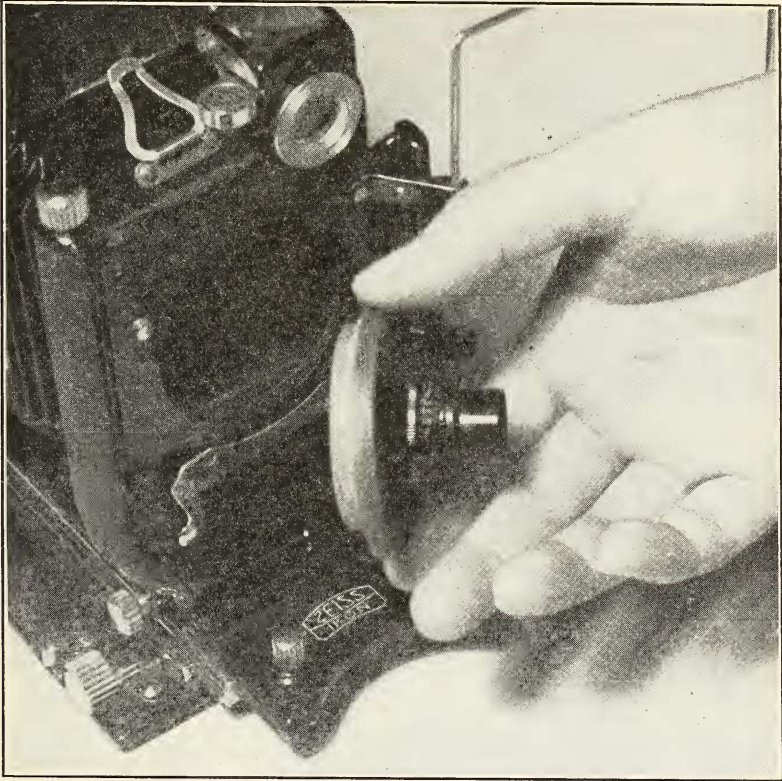


By screwing out the front element of the Tessar lens and using only the rear element, pictures approximately twice natural size can be obtained.

shutter. Such magnified pictures require photoflood lighting and rather long exposures. With supersensitive film and two photoflood lamps eight inches from the subject, I find sixteen seconds is an average exposure with the lens stopped down to f.16.

Using Equipment. Some general suggestions in connection with insect photography, whether you use this type of equipment or some other, may be of assistance.

Subjects. Any of the large silk moths, *Cecropia*, *Luna*, *Polyphemus*, *Promethea*, are excellent subjects for your first pictures. You can photograph them in the spring just after they have emerged and are hanging motionless. Moths that emerge indoors from collected cocoons can be placed on appropriate backgrounds and photographed near a window or by photoflood or photoflash illumination. The less active insects, the praying mantes, katydids,



One-inch lens, in its wooden mount, being slipped into place after the Tessar lens and Compur shutter have been removed.

etc., also offer good chances of early success.

Focus. You can either focus on a plant and await the coming of a butterfly or stalk these insects in the open field. Dr. Otto Croy, a noted German nature photographer, equipped his camera with a slender rod projecting a certain number of inches beyond and below the lens. With the camera sharply focused at this distance, he stalked his subjects, approaching carefully until the end of the stick was below and in line with the insect. Then he snapped the shutter, sure his picture was in focus. You can also focus on a plant and then place an insect where you want it. Aids to keeping the subjects quiet will be discussed later. It is wise to "stop down" always, when possible. The chances of getting a sharp picture with the camera set at $f.32$ are usually much greater than

at f.4.5. The smaller the diaphragm opening, the greater the depth of focus, or distance from the nearest to the farthest object in the picture in perfect focus. Because you are working so close to your subjects, your depth of focus normally is very shallow.

Tripod. A camera focused while on a tripod is in no danger of moving just as the shutter is snapped and thus spoiling the picture. The average of good pictures will go up almost invariably if the amateur learns to stop down and to use a tripod.

Stopping Motion. If the subject moves, the picture is blurred and spoiled. So care must be taken to snap the shutter when the subject is motionless. Incidentally, because the image is magnified oftentimes in insect work, the movement is correspondingly magnified and extra care is needed to avoid blurred pictures. Some insect photographers have used a little ether or fumes of ammonia to quiet the insect and make it cling quietly in one position while the picture is taken. I have found that taking moth pictures in the daytime and butterfly pictures at night, by artificial light, reduces the chance of movement. The insects are naturally less active at such periods. Placing an insect subject in an icebox for a few minutes will sometimes slow down its activity so the desired picture can be made. Winds seem to spring up as soon as the insect photographer starts work, swaying the foliage and increasing the difficulty of stopping motion. Cloth shelters can sometimes be constructed around the plant. Or the plant can be brought indoors and the picture made by photoflood illumination.

Magnified Pictures. Such long exposures are required for pictures of parts of insects made with the one-inch lens and the double-extension bellows, that only killed specimens can be used. The simplest method of getting the subject in focus is to place the dead insect on the end of a piece of modeling clay which has been drawn out into a gooseneck. This can be moved about until the subject is directly in line with the little lens.

Film. Supersensitive panchromatic film has two advantages: It is sensitive to all colors including red and so records pink or reddish markings on insects as varying shades of gray. Other "colorblind" films show them all as black. Also, its higher speed enables you to give shorter exposures, thus lessening the chances of movement, and at the same time stop down and increase the chances of getting everything sharply in focus.

Developer. For developing insect negatives, a fine-grain formula, such as D76, is preferable. It enables you to enlarge a small section of your negative, if you desire to do so, without having the resulting picture marred by graininess.

Enlargements. Oftentimes, in enlarging your best negatives you can produce a more interesting or striking picture by using only part of the picture originally photographed. If you are preparing your pictures for reproduction, or if you desire to show maximum detail, it is best to make the enlargements on glossy paper rather than on varieties having a matte or semi-matte surface.



The Hour of Prayer—for more. Photo by Edwin Way Teale.